

Application, effectiveness, and limitations of the electrophysiological diagnosis of neurotoxic effects of chronic environmental mycotoxins in humans

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Abstract

An extensive body of data demonstrates that diverse groups of mycotoxins can alter the structure and function of the nervous system in a variety of ways with notable human health consequences. Myconeurotoxicity refers to any adverse effects of exposure to mycotoxins or byproducts of primary and secondary mold metabolism, including volatile organic compounds (VOCs) on the structural or functional integrity of the developing or adult nervous system. Neuromycotoxic effects may involve a spectrum of biochemical, morphological, behavioral, and physiological abnormalities whose onset can vary from immediate to delayed action, following exposure to a mycotoxin, and whose duration may be transient or persistent and result in disability, while some may have life-threatening consequences. Myconeurotoxicity may result from effects of the mycotoxins acting directly on the elements of the nervous system or acting on other biological systems, which then adversely affect the nervous system. This paper reviews the application, effectiveness, and limitations of the electrophysiological diagnosis of myconeurotoxic effects of chronic environmental exposure to mycotoxins. The systemic targets of mycotoxic effects were reviewed for greater understanding as to why different neurophysiological test techniques have different levels of outcomes. Thus, nerve conduction velocity, sensory, motor, and evoked potentials, electroencephalographic techniques were evaluated using previously published papers and our clinical experience. Although, neuromycotoxic disorders can be established using clinical electrophysiological diagnosis, there is always the possibility of false positive and false negative results in some patients, which may be due to a multi-factorial etiopathogenesis of neuromycotoxicity. Detection of nervous system toxicity and other measures of toxicity could be achieved using a combination of these neurodiagnostic techniques.

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